ENVIRONMENTAL ASSESSMENT

Collection and Re-introduction of Endangered Endemic St. Croix Ground Lizard, *Ameiva polops*, to Buck Island Reef National Monument, St. Croix, U. S. Virgin Islands

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National Park Service
Buck Island Reef National Monument
Division of Resource Management and Research
2100 Church Street #100
Christiansted, St. Croix, Virgin Islands 00820
Phone: 340-773-1460 x 235
Fax: 340-719-1791

U. S. Fish & Wildlife Service
Sandy Point NWR/Green Cay NWR
U. S. Federal Building, 3013 Golden Rock
St. Croix, Virgin Islands 00820
Phone/Fax: 340-773-4554

Department of Planning & Natural Resources
Division of Fish & Wildlife
Mars Hill, Frederiksted
St. Croix, Virgin Islands 00840
Phone: 340-773-1082

ABSTRACT

Collection of individuals of St. Croix ground lizard, *Ameiva polops (A. polops*), from Green Cay National Wildlife Refuge and re-introduction to Buck Island Reef National Monument (BUIS) is being undertaken as a measure to mitigate the potential for catastrophic loss of remaining remnant populations from fire, flood, hurricane, tsunami, and non-native predation. Re-introduction will establish a new population and will increase species range into a high quality habitat in a federally protected natural area. BUIS was identified as the re-introduction site for *A. polops* in the U.S. Fish and Wildlife Service (USFWS) Recovery Plan (USFWS 1984). In 2001, as preparation for *A. polops* re-introduction to BUIS, the National Park Service (NPS) successfully eliminated mongoose (*Herpetes javanicus*) and rats (*Rattus rattus*), exotic predators of *A. polops*, from BUIS (Witmer 2007). With success of islandwide rat eradication program NPS and FWS conducted biological assessment for the re-introduction of St. Croix ground lizard to BUIS and that it is anticipated that its re-introduction "may be beneficial" to the species (NPS 1983). In 2002, BUIS habitat assessment was conducted to determine existence of critical habitat requirements for *A. polops*, and that current nonnative plant control program would have no impact on re-introduced population; findings indicated BUIS would provide suitable habitat for A. polops (McNair et al, 2003). In 2007, Mackay estimated an *A. polops* population on Green Cay NWR from 576 up to over 2000 individuals based on two different survey methods. Based on these findings the Ameiva Working Group determined using the lowest population estimate of 576 individuals' removal of 10%, 64 adult and sub-adults would not adversely affect the parent population and that re-introduction was warranted. Furthermore, the NPS and USFWS anticipate that the proposed activities will enhance the conservation status of the species. In 2007, the NPS, in collaboration with the USFWS and the Virgin Islands Department of Planning and Natural Resources – Division of Fish and Wildlife (VIDPNR), and Texas A&M University initiated actions toward the translocation and re-introduction of *A. polops* to BUIS. These activities will be undertaken in 2008. The USFWS and the NPS are conducting this Interagency Environmental Assessment covering both collection and translocation/re-introduction of *A. polops* to Buck Island Reef NM. Texas A&M University herpetology team will conduct capture, translocation, re-introduction monitoring on BUIS during critical first months. In subsequent years monitoring of project success will be a collaborative effort between all involved agencies and executed by the NPS Division of Resource Management.

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SECTION I – PURPOSE AND NEED FOR PROPOSED ACTION

1.1 PURPOSE

The National Park Service, Buck Island Reef National Monument and the U. S. Fish and Wildlife Service, Green Cay National Wildlife Refuge, plan to capture and collect individuals of St. Croix Ground Lizard (*Ameiva polops*) from Green Cay National Wildlife Refuge, St. Croix and translocate to Buck Island, St. Croix, Virgin Islands. The re-introduction of *Ameiva polops* to Buck Island Reef NM is a stated recovery objective of the Recovery Plan for the St. Croix Ground Lizard, *Ameiva polops* (1984). Translocation of individuals of *A. polops* is being undertaken as a measure to mitigate the potential for catastrophic loss of remaining remnant populations from Green Cay NWR, Protestant Cay, and Ruth Cay from fire, flood, hurricane, tsunami, habitat loss and degradation, and non-native predation; and to enhance the conservation status of the species. Translocation and re-introduction will establish a "self-sustaining population (500 or more individuals) on Buck Island increasing the species range into a high quality habitat in a federally protected natural area and obtain an adequate population dispersion so the species can be considered for reclassification from endangered to threatened.

The purpose of this Environmental Assessment is to consider a range of re-introduction alternatives that have been proposed, evaluated, and discussed among concerned agencies, and to select a preferred alternative. Alternative B is the preferred alternative, which increases the species range into a federally protected high quality habitat thereby reducing the threat of catastrophic loss of the species, eliminates exposure to non-native predators (mongoose and tree rat), and provides for opportunity to establish a self-sustaining population. Cost-

effective translocation and re-introduction of *A. polops* will maximize benefits to wildlife and provide the more opportunities for public in the form of environmental education and awareness.

1.2 NEED

The goal of this action is to help achieve the recovery of the St. Croix Ground Lizard (*Ameiva polops*). Specifically, the goal is to obtain adequate population dispersion so the species can be considered for reclassification from endangered to threatened. This endemic species one of only three native lizards to St. Croix, Virgin Islands became globally endangered in the 1900s after the Javan mongoose (*Herpetes javanicus*) was introduced to St. Croix, U.S. Virgin Islands (USFWS 1984). The introduction of mongoose along with coastal development and predation by feral cats and dogs has been implicated in the extirpation of *A. polops* from St. Croix (Knowles 1990). *A. polops* survives today on only three small near-shore cays around St. Croix and nowhere else in the world. The largest remaining population resides on Green Cay, a 14.2 acre cay that lies 1.5 miles southwest of Buck Island. Green Cay became a National Wildlife Refuge in 1977 to offer protection to this lizard and its habitat. Two smaller populations reside on Protestant Cay (3.0 acres), an islet in Christiansted Harbor consisting of a hotel and maintained grounds; and Ruth Cay (27 acres), a flat, dredged-material islet located off the south shore of St. Croix in the shipping channel of a major oil refinery. Both islands are easily accessible by the public and offer little protection for the lizard. Hotel on the Cay, the hotel on Protestant Cay, is currently working in concert with the VIDPNR in managing their vegetation and cattle egret population for the benefit of *A. polops*. Ownership of Ruth Cay is disputed and although the *A*. *polops* population here appears persistent and healthy (McNair 2003), it has no formal protection. The population on Ruth Cay was successfully translocated in 1990 with 10 individuals from Protestant Cay and one from Green Cay NWR (Knowles 1996). Presently, fewer than two thousand individuals survive in the wild and all are restricted to three small offshore cays including Green Cay National Wildlife Refuge, Protestant Cay, and Ruth Cay.

The proposed action is a fundamental element of the St. Croix Ground Lizard Recovery Plan (USFWS 1984) and was identified as “may effect beneficially” to re-introduce *A. polops* to Buck Island Reef NM upon successful eradication of mongoose from the park (NPS 1983). Mongoose (1995) and tree rats (2001), non-native invasive species, have been eradicated or controlled from the park meeting translocation and re-introduction criteria for *A. polops*. NPS Buck Island Reef NM in consultation with U. S. Fish & Wildlife Service, and Government of the Virgin Island Department of Planning and Natural Resources, Division of Fish & Wildlife, have agreed translocation and re-introduction of *A. polops* to Buck Island will benefit the species survival (McNair et al 2003, NPS A. polops Implementation Plan, 2007). The action minimizes the risks of the species extinction because it is less likely that catastrophic events (hurricanes, tsunamis,

fires, etc), and other threats (e.g. predation and habitat loss), will affect equally and simultaneously four spatially segregated populations. The proposed action is expected to foster the recovery of the species because *A. polops* released in the fully protected high quality habitat in the park and ultimately will result in a self-sustaining population which should mimic the extant wild population on St. Croix, Virgin Islands.

Actions need to include: 1) capture and collection of individuals on Green Cay National Wildlife Refuge, 2) translocation and re-introduction to Buck Island Reef National Monument, 3) post re-introduction monitoring and develop and implement monitoring protocol and 4) protection and education of visiting public concerning species introduction and long-term survival.

1.3 REQUIRED DECISIONS

The NPS will determine whether and how to conduct the translocation and re-introduction of *A. polops* to Buck Island, which is the preferred alternative of this EA. This decision must incorporate the best available scientific information and appropriate measures to protect the species if action is taken. NPS and USFWS decision will also incorporate measures to protect related resources if action is taken. In the meantime, any decision the Services reach will include avoidance and minimization measures for reasonably foreseeable adverse impacts. The NPS and USFWS must coordinate and consult with its partners, in particular, the Government of the Virgin Islands Department of Planning and Natural Resources, Division of Fish & Wildlife who have management authority over territorial natural resources between the federal conservation areas at Green Cay NWR and Buck Island Reef NM.

1.4 BACKGROUND

The St. Croix Ground Lizard populations have been estimated as low as 500 individuals on Green Cay and less than 100 each on Ruth and Protestant Cays within the past 10 years. These populations are threatened by nonnative predators, habitat restrictions and loss, anthropomorphic activities, hurricanes and storm surge. The largest population of *A. polops* resides on Green Cay National Wildlife Refuge (GCNWR). Recent surveys estimate the population in the several hundreds (Philibosian and Rubial, 1971~300 individuals; USFWS 1984~2,500 individuals; Meier et al, 1993~400-500 individuals; McNair and Lombard, 2004~183 - 258 individuals; MacKay, 2007~576 individuals however due to difficulty with detectability authors suspect this is an underestimate**.** The most recent surveys conducted by DPNR-Division of Fish and Wildlife estimate between 1000 and 2000 individuals on all three offshore cays, but the surveys are incomplete and unpublished (J. Valiulis, DPNR-DFW, pers comm. 2007).

Limited and poor-quality habitat (small islands) severely reduces this species health and long-term potential of the *A. polops* population. In 1989 St. Croix and

all its associated islands were severely damaged by Hurricane Hugo. This hurricane, followed by a succession of other storms in 1995, 1998, 1999, has reduced optimal lizard habitat on GCNWR, eliminating critical canopy that to date has not re-grown (McNair and Lombard, 2004; C. Lombard, USFWS, pers. comm. 2007). Habitat degradation caused by introduced tree rats has reduced and altered preferred *Ameiva polop* habitat; USFWS began non-native predator control efforts for tree rats (*Rattus rattus*) in 2000 and began a reforestation project in 2004 to improve the habitat quality at GCNWR. In addition, Mackay (2007) suggests continued habitat restoration by removing hurricane grass and ginger thomas to improve *Ameiva* habitat conditions on Green Cay.

Protestant Cay hosts a private hotel complex where the lizards are threatened by hotel development and maintenance activities (landscaping), nesting and roosting cattle egrets, guest activities and predators (mongoose and rats). During 2007 site visit confirmed lizards presence, but no formal population estimates were conducted.

Ruth Cay is a small island created from dredge spoil and has little terrestrial relief. Currently the population status on Protestant Cay is unknown; however populations on Ruth Cay and GCNWR appear stable. The populations on all three cays remain threatened without expansion to BUIS by hurricane, storm surge, habitat loss, accidental fires, and re-introduction of exotic predators. During a mark-resight survey conducted by herpetologists from Texas A&M University in December 2007, 30 adult *A. polops* were captured, marked, and released near and along the western beach from approximately the fishing camp, northwards to the shipwreck. Based upon the subsequent resight survey, where an average of 1 marked and 9 unmarked individuals were observed, the lizard density may be as high as 762 lizards per hectare based on the Lincoln-Petersen population estimation method. However, this is not definitive because no confidence intervals could be computed with such a small portion of resighted individuals (Treglia, unpublished, 2008).

BUIS was identified as the reintroduction site for *A. polops* in the USFWS Recovery Plan (USFWS 1984). It was presumed present on Buck Island by Philibosian and Rubial (1971) prior to the introduction of mongoose in 1912. The Recovery Plan states two goals: 1) to establish a self-sustaining population on BUIS; and 2) to obtain adequate population dispersion so the species can be reclassified from endangered to threatened. Prior attempts to translocate *A. polops* to BUIS (1968 and mid-1980s) were initially successful (Philibosian and Ruibal, 1971), but ultimately failed because of the continued presence of exotic predators (Philibosian and Yntema 1976).

The National Park Service has undertaken several management actions on Buck Island Reef NM to meet the recovery goals for *A. polops*. NPS, jointly with USFWS and VIDPNR/DFW, began working toward eradication of nonnative predator mongoose in the 1970s and successfully completed eradication of

mongoose and rats by 2001, making the island inhabitable for *A. polops* (Witmer and Hillis-Starr 2002; Witmer 2007). NPS Division of Resource Management ensures BUIS remains rat- and mongoose-free. NPS conducts bi-annual snap trap-line assessments along five trap lines that sample the entire island to verify the continued absence of rats. As of 2005 no rats have been captured since the conclusion of the island-wide eradication project (Witmer, 2007). NPS monitors the island for mongoose, year round by visual and auditory surveys since the mongoose is a diurnal predator that typically hunts along the shoreline leaving easily identifiable tracks and making noisy calls. No sign of mongoose has been recorded since 1995 when the last mongoose skeleton was found. In addition, NPS has not documented any mongoose or rat predation on any sea turtle nest or hatchlings during the annual night-time Buck Island Sea Turtle Research Program (as of June-October) nor during year round day-time monitoring.
In 2001, U.S. Geological Survey (USGS) completed a herptofauna inventory on BUIS as part of the NPS Vascular Plant and Vertebrate Inventory and recorded three species of non-marine reptiles on the island, all lizards. Two are native species, the St. Croix anole (*Anolis acutus*) and the cotton ginner dwarf gecko (*Sphaerodactylus beattyi*). The other species is non-native, the tropical house gecko (*Hemidactylus mabouia*). The USGS report states “the herptofauna of Buck Island is small, but the list of species protected by the National Monument includes two species endemic to St. Croix and surrounding cays, and three species of internationally protected sea turtles (leatherback, green, and hawksbill). Buck Island may serve as a suitable site for re-introduction of the federally endangered St. Croix ground lizard now that the mongoose and the black rat have been extirpated from the island. The only non-native species on Buck Island, the tropical house gecko, appears to occur in very small numbers; based on information from other similar islands it appears unlikely that the tropical house gecko will affect the native fauna of Buck Island” (Waddle and Rice, 2002). In 2004, the threatened loggerhead sea turtle (Carretta carretta) was documented nesting on Buck Island increasing number of species of reptiles documented for the park; this is the first recorded nesting by loggerhead sea turtle in the Virgin Islands in modern history.

In 2003, as further preparation for *A. polops* re-introduction to BUIS, NPS asked Dr. Tom Herman from Acadia University, Nova Scotia; a Specialist in “species at risk”, to conduct an island-wide habitat assessment for *A. polops* re-introduction. Working with Biologists Douglas McNair, VIDPNR/DFW and Claudia Lombard, USFWS; and NPS Supervisory Exotic Plant Specialist Dan Clark, Dr. Herman conducted habitat assessment fieldwork comparing habitats preferred by the lizards on Green Cay, Ruth Cay and Protestant Cay with existing habitat at BUIS. Dr. Herman’s study follows Recovery Plan goals "to evaluate the available vegetative and soil associations and select that (those) protected site(s) that are similar to the habitat associations on Green Cay" (USFWS 1984).

As summarized from McNair et al 2003, Buck Island Reef habitat was compared to all three offshore cays supporting *Ameiva* populations. Comparisons between

random sites on lizard-inhabited Ruth and Protestant Cays and random lowland sites on Buck Island reveal no significant differences in the nature of light patches, suggesting similar habitat structure between existing and potential habitats. Analysis of uplands areas found less similarilities between small cays and Buck Island however, these upland areas will provide important vertical refuges from flooding events that are not available on the three smaller and lower cays that presently sustain all existing lizards.

In 2002, BUIS conducted an island-wide vascular plant inventory, which found that only nineteen out of the 228 plant species on the island are non-native (Woodbury and Little 1976, G. Ray 2002 unpublished). Of those 19, six species are known to be invasive and were of immediate concern. In 2004, BUIS began an island-wide non-native invasive plant eradication project targeting ten of the non-native species; herbicides specific for grasses (foliarly application) or woody vegetation (basally treated) were used. To date the entire island has been treated for these ten target non-native invasive species six times. Of the 176 gross infested acres, 22.64 infested acres have been treated and remain under control. The Monument, with assistance from NPS Exotic Plant Management Team and the South Florida/Caribbean Supervisory Exotic Plant Specialist, will continue control efforts for non-native invasive plants annually, targeting fewer acres per year. The resulting reduction in non-native invasive species, particularly guinea grass (*Urochloa maxima*), tamarind (*Tamarindus indica*), *Tecoma stans* (cedar Thomas), and tan tan (*Leucaena leucocephala*), in Buck Island's coastal habitats will eliminate vegetation types that provide poor leaf litter, alter canopy, and create hazards and obstructions for lizard movement. The majority of the future non-native plant control work will be primarily outside *A. polops* coastal habitat, and future treatments are not expected to have any impact on the introduced population but will continue to improve habitat.

In 2003 and 2007, based on the findings of Dr. Herman's Buck Island Reef habitat assessment, the Virgin Islands/Puerto Rico multi-agency Ameiva Working Group was established to collaborate on the translocation and introduction plan. The Ameiva Working Group consisted of NPS/Buck Island Reef NM/Division of Resource Management, St. Croix, USFWS-Sandy Point NWR/Green Cay NWR, St. Croix, USFWS Caribbean Ecological Services Field Office/Puerto Rico, Virgin Islands DPNR-Division of Fish & Wildlife, Acadia University, Maryland Cooperative Fish and Wildlife Research Unit (USGS), and Texas A&M University-Department of Wildlife & Fisheries Sciences met to discuss and plan the next steps. *A. polops* population assessments for GCNWR, Protestant Cay, and Ruth Cay were to be conducted and genetic analysis of tissue samples from individuals captured and tagged would be collected. NPS BUIS and USFWS would undertake Interagency Environmental Assessment for the capture, collection, translocation and re-introduction of *A. polops* from Green Cay to Buck Island Reef NM. NPS project funds will be used to support a professional herpetology team from Texas A&M University to conduct the capture, collection, and translocation and re-introduction of *A. polops* to BUIS and the post-

translocation monitoring during the critical first year. NPS will provide in-kind support for the translocation and re-introduction population research project. After the first year, re-introduced *A. polops* population monitoring will be implemented by BUIS staff collaboratively with USFWS, and DPNR-DFW.

Habitat assessment, home range, survivorship, population density and thermoregulatory behavior work on GCNWR, both historically by Dr. James Wiley, Maryland Cooperative Fish & Wildlife Research Unit, USGS, and presently by his graduate student Amy Mackay, show that the lizards are associated with open-forest, canopied habitats which provide leaf litter, a mosaic of sun and shade, and substrate suitable for burrowing. The results of these studies coupled with Dr. Herman's work and the ecosystem-wide changes implemented by NPS at BUIS provided the groundwork for subsequent research and survey methods used in determining the success of the translocation and re-introduction to BUIS.

The re-introduction of *A. polops* to BUIS is a valuable step in carrying out the NPS mandate to preserve and protect resources and fulfill a long-term endangered species project that began in the 1960s. With the success of the Monument-wide non-native predator control program, BUIS is ready to re-introduce *A. polops* to the island. Since the lizard cannot be successfully re-introduced to St. Croix (due to the uncontrolled populations of mongoose, rats, feral cats and dogs and exotic vegetation creating less than optimal habitat, as well as the presence of Ameiva exsul (a territorial and highly competitive species of Teiid lizard)), introduction to BUIS is vital. BUIS provides federally protected land that will reduce the likelihood of *A. polops* extinction. BUIS is a larger land area than the three low-lying cays that currently support *A. polops*; the relief and size of BUIS will reduce the potential hurricane and storm surge impact to the translocated population. BUIS will also provide high-quality habitat protected from non-native predators (due to regular monitoring) and development where *A. polops* populations will begin to recover undisturbed in the Virgin Islands. Based on findings from Herman's Ameiva habitat assessment, the NPS monitoring data of the absence of non-native predators, and on current population density and behavior work at GCNWR it has been determined that the Monument is ready for the translocation and re-introduction of A. polops, which will initiate the start of successful population recovery to eventually meet the goals of the St. Croix Ground Lizard Recovery Plan, 1984.

SECTION II – ALTERNATIVES

2.1 ALTERNATIVES ANALYZED IN DETAIL
The alternatives under considerations include:

Alternative A: No Action
Alternative B: Translocation and re-introduction to BUIS (Preferred)
Alternative C: Translocation to St. Croix, mainland
Alternative D: Translocation to other U.S. Caribbean island location

The alternatives are presented separately to highlight salient strengths in terms of suitability and tradeoffs.

2.1.1 Alternative A – No Action; Do not translocate, maintain and improve habitat for existing three populations on Green Cay NWR, Protestant Cay, and Ruth Cay

Under this alternative, the fundamental goal of the action would not be accomplished; there would be no re-introduction of St. Croix Ground lizard to Buck Island Reef NM. Specifically, another spatially segregated and self-sustaining population of St. Croix Ground lizards would not be created to reduce the chances of catastrophic loss of the species. Without the creation of a fourth population on the only remaining island adjacent to the main island of St. Croix (*A. polops* ancestral home range) there is limited future for the species due to the spatial and habitat limitations, and threats to the existing populations on the three offshore cays. At present, available resources and opportunities on Green Cay NWR, Protestant Cay, and Ruth Cay are aimed at maintaining existing populations, controlling non-native predators, and improving existing habitat conditions. However due to the limitations on the three cays no major population growth can be expected and radical population fluctuations may occur as a result of natural variation in a variety of factors including weather (temperature, rainfall, etc.), prey base, and natural catastrophes, accidental man-caused damage (fires), which could, at times, increase chances for extirpation on individual islands. Therefore improving conditions for St. Croix Ground lizard on Green Cay NWR, Protestant Cay and Ruth Cay should not be mutually exclusive but complimentary to translocation to Buck Island Reef NM.

2.1.2 Alternative B – Capture, collect, translocate, and re-introduce *A. polops* to Buck Island Reef NM; *Preferred Alternative*

Under this alternative, the NPS and FWS would cooperatively catch and collect *A. polops* from Green Cay NWR, translocate and re-introduce captured individuals to Buck Island Reef NM in the spring of 2008. NPS, FWS, and collaborating Texas A&M University herpetologists and students will conduct intense post re-introduction monitoring for 3 months and NPS and FWS staff will conduct monitoring on A. polops thereafter according to established monitoring program reviewed and approved by NPS South Florida/Caribbean Inventory and Monitoring Program team.

A. polops will be release in the area ranging from Buck Island's south west corner through the north shore beach forest which will provide required forest cover, structure, refugia, and prey base. It was documented that during the initial1968 *A. polops* release in this same general area that despite of the presence of exotic predators *A. polops* did initially survive in this habitat and reproduce (NPS 1983). In the absence of those predators and with improved beach forest habitat this area should provide all critical requirements for the

translocation population's survival. Standard capture and handling methods used for most Teiid species will be followed and have proved successful for similar species*. Ameiva polops* will be captured using a noose, which is a common and safe technique used for catching a wide variety of lizards including other Teiids (i.e., Verwaijen et al. 2002) and has been used on *A. polops* by previous researchers (Meier et al. 1993). Measurements including snout-vent length (SVL), total tail length, regenerated tail length, and mass will be taken on all individuals. All individuals captured will be toe-clipped, which is a standard and accepted marking procedure (Dodd 1993, Borges-Landáez and Shine 2003) and adults >50mm SVL will be permanently marked using glass beads sutured to their tail as described by Fisher and Muth (1989). These techniques are commonly used because of minimal effects on the subjects, and all individuals will be observed upon release to ensure there are no obvious injuries that may contribute to mortality.

While in temporary enclosures lizards will be monitored daily by trained observers walking through and around the 10 x 10 m enclosures. Observers will begin at random times (to 20 min. intervals) between 1000h and 1500h. The following data will be collected upon the first sighting of each lizard:

- Bead combination;
- Location;
- Microhabitat;
- Sun/Shade;
- Behavior

Upon release from the enclosures 18 individuals will be radio-tracked for approximately 14 days (the life of the transmitters) to monitor immediate survival and dispersal. Visual encounter surveys will be concentrated within 50m from the enclosures to help monitor dispersal. When lizards are found >50m from enclosures, Visual Encounter Surveys will be expanded accordingly (Treglia, 2008).

Thereafter for the first year monthly visual surveys will be conducted using standardized protocol for monitoring Teiid lizards (Treglia, 2008). For example, trained observers will carefully walk through the translocation area in the beach forest habitat on BUIS between 1000 and 1500 h. Start and stop times for visual encounter surveys will be noted so that search-effort can be quantified. Observed *Ameiva* will be classified as juvenile or adult. If marked individuals are seen, the bead combination will be noted. Each observation location will be recorded with a GPS. With this information, the locations of lizards can be plotted and the encounter rate (lizards/person-hour) can be computed. Dispersal movements can be quantified for marked individuals

2.1.3 Alternative C – Translocate and re-introduce to main island of St. Croix, Virgin Islands

Under this alternative, *A. polops* from Green Cay NWR would be collected and translocated to suitable habitat on the main island of St. Croix. Due to the uncontrolled populations of mongoose, rats, feral cats and dogs and exotic vegetation creating less than optimal habitat and both commercial and private coastal development *A. polops* cannot be successfully re-introduced to St. Croix at this time. In addition, *Ameiva exsul* has been documented on St. Croix which precludes releasing *Ameiva polops* back to St. Croix until this species has been controlled. A. exsul presents a threat to A. polops through competition for space, forage/prey items, and possible predation threat. This alternative does not meet goals for the recovery of the species.

2.1.4 Alternative D – Translocation to other U. S. Caribbean island location

Under this alternative, *A. polops* from Green Cay NWR would be collected and translocated to another offshore island with suitable habitat located in the northern Virgin Islands or Puerto Rico. Potential offshore cays exist in the northern Virgin Islands and Puerto Rico; however, it is extremely likely that A. polops never occurred there in the past (outside Ameiva polops historic range) and therefore translocation to the northern Virgin Islands or Puerto Rico would in effect be introducing a non-native lizard into that ecosystem adversely impacting native lizard populations. Moreover, the uncontrolled populations of non-native predators and vegetation makes it unlikely translocation to these areas would succeed. The logistics and cost to conduct these translocations is also a negative factor for this alternative. This alternative does not meet goals for the recovery of the species.

2.1.5 Environmentally Preferred Alternative

In accordance with DO-12, the NPS is required to identify the “environmentally preferred alternative” in all environmental documents, including EAs. The environmentally preferred alternative is determined by applying the criteria suggested in NEPA, which is guided by the CEQ. As stated in Section 2.7 (D) of the NPS DO-12 Handbook, “The environmentally preferred alternative is the alternative that will best promote the national environmental policy expressed in NEPA (Section 101(b)).” This environmental policy is stated in six goal statements, which include:

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. Assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;

3. Attain the widest range of beneficial uses of the environment without degradation, risk to health and safety, or other undesirable and unintended consequences;
4. Preserve important historic, cultural, and natural aspects of our national heritage, and maintain wherever possible, an environment which supports diversity and variety of individual choice;
5. Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources (NEPA, 42 USC 4321-4347).

In sum, the environmentally preferred alternative is the alternative that, not only results in the least damage to the biological and physical environment, but also that best protects, preserves, and enhances historic, cultural, and natural resources.

Alternative B, to capture, collect, translocate, and re-introduce *A. polops* to Buck Island Reef NM is the preferred alternative as well as the environmentally preferred alternative. In accordance with DO-12, Section 101b, Alternative B allows the Federal Government to use all practical means to improve public resources in this case the globally endangered St. Croix Ground Lizard by establishing a successful population in a federally protected habitat. The re-introduction of *A. polops* to Buck Island Reef NM meets and exceeds goals 1, 3, 4 and addresses goals 2, 5, and 6. NPS as a trustee of the environment will have taken action to preserve *A. polops* for succeeding generations; restore a species to its historic range providing for opportunity for park visitors to see native lizard in natural surroundings; BUIS habitat will be used beneficially to provide federally protected high quality habitat for globally endangered lizard; re-introduction will preserve Virgin Islands natural national heritage; re-introduction of the St. Croix Ground Lizard to new protected habitat will not further impact local population and St. Croix resources and continue to allow for high standards of living, nor will it impact renewable resources or deplete resources further.

SECTION III- AFFECTED ENVIRONMENT

3.1 PHYSICAL CHARACTERISTICS

3.1.1 Location

The location of the proposed action is on Green Cay National Wildlife Refuge and Buck Island Reef National Monument. Green Cay NWR, a 14-acre islet located 0.2 miles north of the eastern shore of St. Croix, VI. The Monument is located six miles east of Christiansted, off the north shore of St. Croix, U.S. Virgin Islands. Buck Island Reef National Monument (BUIS) consists of approximately 19,015 land and water acres north of the island of St. Croix in the U.S. Virgin Islands.

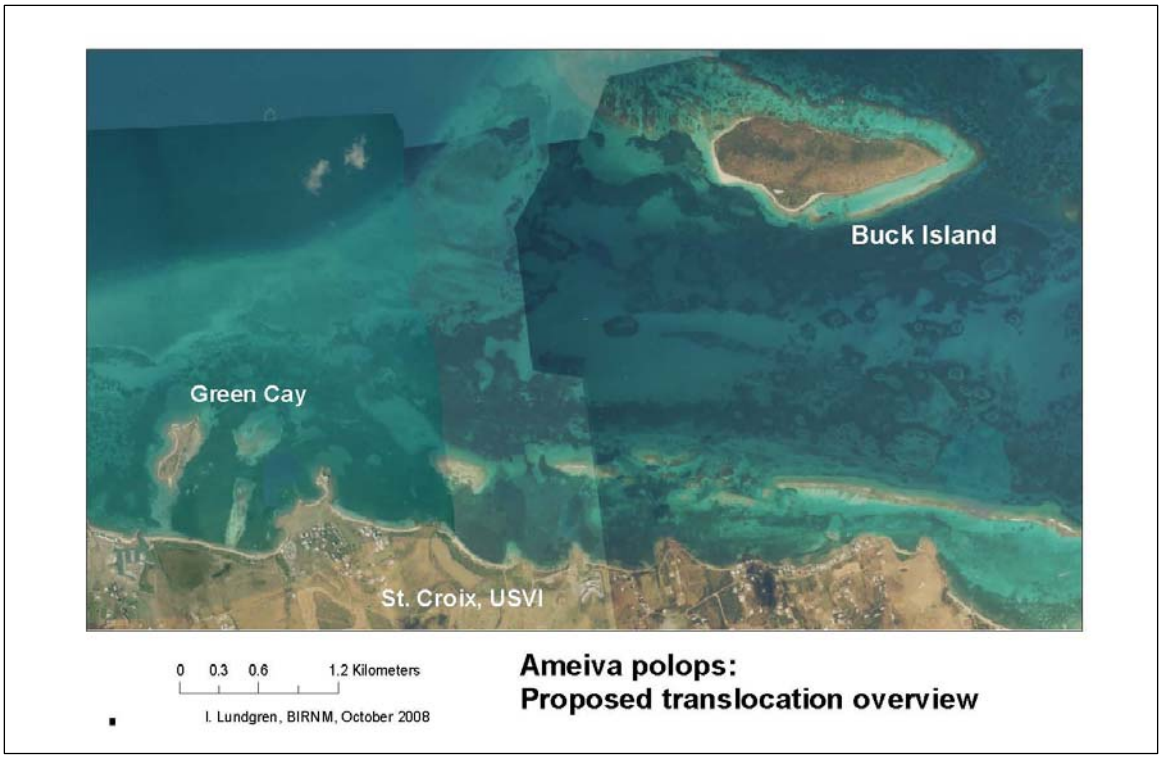

Figure1. Proposed activities will take place between Green Cay NWR and Buck Island Reef NM off north shore of St. Croix, U. S. Virgin Islands.

The island is located at 17^0 47'N, 64^0 37' W, and separated by a 1.8-mile wide channel from the north shore of St. Croix off the main island's eastern section. Buck Island Reef NM is administered by the National Park Service, U. S. Department of the Interior. The affected area is the 176 acre island including the beaches, shoreline, beach forest, and upland tropical dry forest habitats, as well as, the visitor day use facilities including the picnic areas and hiking trail. Park concession operations bring visitors to the island either on half or full-day charters which include the boat trip to the underwater snorkel trail and one or two hour visit to the island. Visitor activities include hiking the one overland hiking trail, swimming off the beach, sunbathing, snorkeling any of the numerous shoreline reefs or picnicking at one of the two picnic areas on the south side of the island. Visitor time on the island is concentrated on the open sand beach area; exploration off-trail is discouraged to prevent visitor contact with a variety of hazardous native plants (spines, thorns, and burning sap).

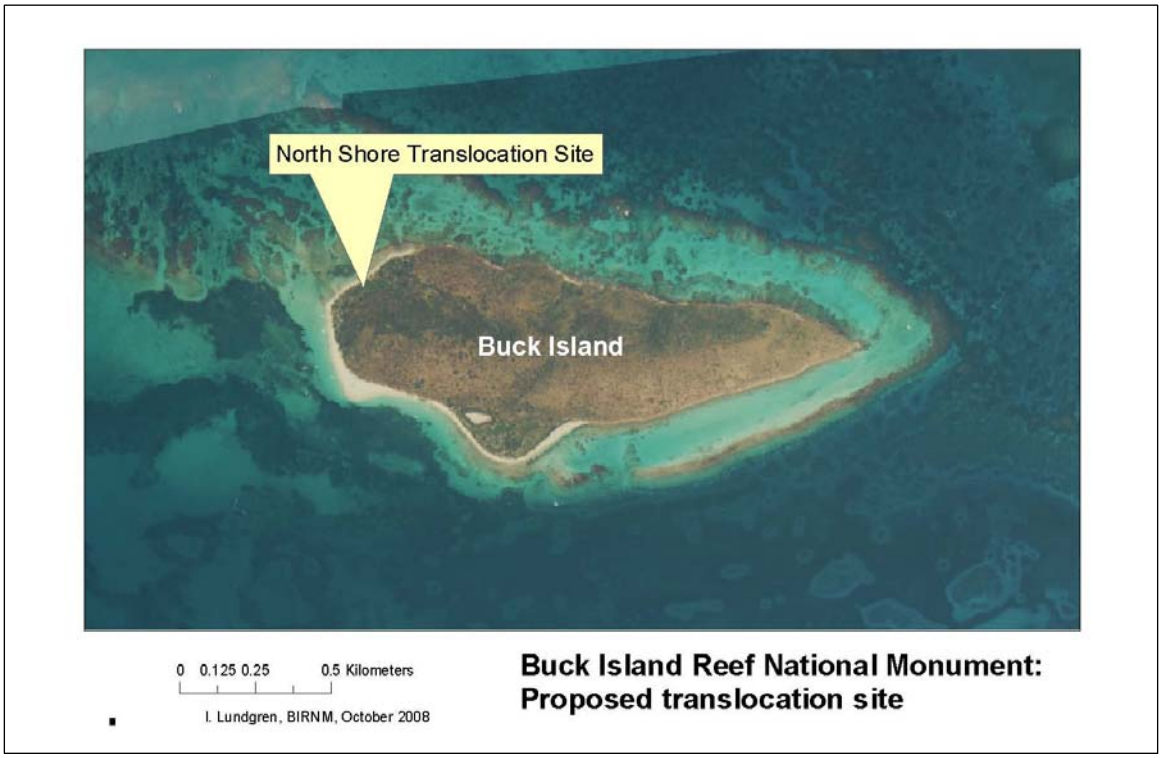

Figure2. Buck Island Reef National Monument, St. Croix, U. S. Virgin Islands

3.1.2 Geomorphic/Physiographic

The island's biotic communities cover 176-acres of mostly sloping terrain. Its most prominent topographic feature is a single, .99-mile ridgeline running approximately east-to-west. The ridge rather evenly divides the shrublands into north and south orientations, adding a measure of microclimatic variability to an otherwise uncomplicated environmental setting. Topographic relief and variation are low. The highest point is just over 300 feet, and nearly seventy percent of the island consists of slopes ranging from 20 – 70%.The two low, sandy benches, one on the west end and the other, Dietrich's Point, on the south, possess recreational value as well as providing habitat for vegetation and wildlife. A fine beach of white coral sand, West Beach, extends for about 1000 feet on the southern side of the west bench. Otherwise the shore is gravelly or rocky falling steeply into the sea on the island's eastern two-thirds. A small, rain-fed salt pond is located along the south side of the island. Another fairly level area of about 10 acres is located on the west end of the island, north shore beach forest area. The wide open sandy beach changes in shape and size with seasonal sand transport. Significant bottomlands include a basin mangrove swamp with a salt pond, perimeter saltgrass marsh and adjacent flatlands amounting to five hectares on the island's south-central coast, and a small coastal plain of 6.6-acre occupying the west to northwest coastline.

3.1.3 Soils

The upland soils of Buck Island are dominated by shallow, well-drained, stony soils that cover the slopes and summits. The soils are generally 10 inches deep or less, with weathered bedrock found at depths from 10 to 30 inches (USDA 2002). The general soil map of St. Croix produced by the U.S. Department of Agriculture Natural Resources Conservation Service indicates that the majority of Buck Island is characterized by the Southgate-Victory-Cramer general soil map unit, while a very small parcel of the northeastern tip of Buck Island is characterized by the Annaberg-Cramer-Southgate soil map unit. Both units are described as well drained, steep to very steep soils on summits and side slopes of volcanic hills and mountains. The Southgate-Victory-Cramer unit is described as shallow, moderately deep and shallow while the Annaberg-Cramer-Southgate is described as shallow. Both units are associated with rugged hills that are dissected by very narrow valleys that have dendritic drainage patterns (USDA 2002).

A small, rain-fed salt pond is located on the south side of Buck Island slightly east of Dietrich's Point Picnic area. Saline marshes in this region are characterized by very deep, very poorly drained soils that have been formed by alluvial and marine sediments and the remains of hydrophytic plants. These soils are high in organic matter and would commonly be called muck (USDA 2002).

3.1.4 Climate and Hydrology

The mean annual temperature in the Virgin Islands is 77^0 F (USDA, NRCS unpublished data). The mean monthly temperature varies only 5 to 7^0 F through the year (72^0 – 78^0 F), while mean daily maximum and minimum temperatures in warmest months range from 74^0 – 88^0 F and the coolest months from 68^0 – 82^0 F. Relative humidity (airport measures are typically drier than forests) is high year-round, with mean nighttime levels at 86% and mean daytime levels at 69%. Mean monthly nighttime relative humidity ranges from 81% in the driest months to 90% in the wettest months. Mean monthly daytime ranges are 63% in January (driest) to 73% in August and September (wettest). Northeast trade winds blowing in winter months at 10-20 knots for 60% of the time, and > 20-kt winds 25% of the time (increasing periodically with northerly Christmas winds) add greatly to desiccation effects. Trades are continuous most of the year, abating somewhat by middle to late summer and returning well by middle autumn.

3.2 BIOLOGICAL ENVIRONMENT

3.2.1 Habitat/Vegetation

Currently the terrestrial vegetation within Buck Island Reef National Monument can be described as consisting of six distinct vegetation classifications. These include seasonal deciduous forest, beach forest, mangrove forest, thorn/cactus scrub, thicket scrub, and coastal thicket (Gibney 1996).

The seasonal deciduous forest community is found on guts and ravines, on the landward edge of beach forests, and on portions of the north-facing slopes of hills. The trees that dominate the canopy in this community include gumbo-limbo (*Bursera simaruba),* chinkwood *(Bourreria succulenta),* fish-poison tree *(Piscidia carthagenensis),* water mampoo *(Pisonia subcordata),* white manjack *(Cordia dentata),* and wild lime (*Adelia ricinella)*. Areas that provide more moisture include black cedar (*Tabebuia heterophylla),* black mampoo *(Guapira discolor)*, and ebony (*Krugiodendron ferreum)* in the tree layer. Gibney (1996) describes *Bursera* and *Guapira* trees that are over 100 years old in this vegetation community. Shrubs present in the understory include guayabilla (*Samyda dodecandra),* boxwood *(Schaefferia frutescens)*, and broom bush (*Croton betulinus)* (Gibney 1996).

The beach forest occurs on the coastline around the perimeter of much of the island, but is most prevalent on the west end. The dominant tree in the beach forest canopy is the manchineel tree *(Hippomane manchinella*). The vegetation on Buck Island may be considered dangerous by visitors not familiar with the habitats. For example, the manchineel tree is poisonous and contact with this tree causes painful blisters and eating the fruit can be deadly. Standing under the tree when it rains is also hazardous, as the water passing through the leaves and fruit can cause burns and blisters if it comes in contact with skin. In some areas where recent hurricanes brought down the manchineel, various other trees and shrubs are becoming established. These include water mampoos, *Eugenia axillaris,* sea grape *(Coccoloba uvifera)*, and the non-native tamarind (*Tamarindus indica*) (Woodbury et al 1976).

The thorn/cactus scrub vegetation community is an open shrubland that provides a transition between the seasonal deciduous forest and the thicket scrub, and is found predominantly on the southwestern slope of the island. The community is characterized by spiny shrubs of simple leaf bushweed (*Flueggea acidoton)*, with casha (*Acacia tortuosa)* and greenheart ebony (*Rochefortia acanthophora)* and the tree-like forms of organ pipe cactus (*Pilosocereus royenii*). The thorn/cactus community is located predominantly on the southwestern slope of the island, and transitions into the thicket-scrub on the eastern end. Gibney, 1996 speculated that the dominance of thorny plants evolved due to the grazing habitats of the imported goats and sheep that once inhabited the island. These animals avoided grazing on the thorny or toxic species which flourished without competition from the more palatable species. Visitors are requested to remain on designated trail to avoid resource damage and to avoid getting hurt. Thorn/cactus scrub vegetation can cause painful scratches or other skin irritation.

The thicket/scrub vegetation community is found predominantly on the east side of the island, and to a lesser degree, on the south slopes. This community is also believed to have occurred as a result of decades of grazing by goats and sheep and their preferential grazing on plants without thorns, spines, toxins and other unpalatable attributes. Predominant species in this community include mainly shrubby species such as *Croton* sp., sage (*Lantana involucrate)*, white manjack, bushy heliotrope (*Heliotropium ternatum)*, and prickly bush (*Oplonia spinosa)*.

These shrubs are intertwined with vines such as monarch amazonvine (*Stigmaphyllon emarginatum)* and cluster vines (*Jacquemontia* spp.), creating dense, impenetrable stands. Two cactus species are frequently found as ground cover, including brittle-jointed “sucker” cactus (*Opuntia repens*) or turk’s cap cactus (*Melocactus intortus*).

The coastal thicket forms a narrow band of vegetation landward from the upper beach and berm on the south and west shores. The few woody species in this habitat include sea grape, black torch (*Erithalis fruticosa)*, and bitter ash (*Rauvolfia viridis)* as the dominant shrubby species present, with false button weed (*Spermacoce prostrata),* beach berry *(Scaevola plumieri)(eradicated since 2005),* sea purslane *(Sesuvium portulacastrum)*, and bay bean (*Canavalia rosea)* as the understory species.

There are no shallow estuarine areas or embayments on Buck Island to support a mangrove forest, but mangroves are present around the salt pond on the southern side of the island. Mangroves form a shallow band around the perimeter of the pond and include white (*Laguncularia racemosa*) and black (*Avicennia germinans*) mangroves. Buttonwood (*Conocarpus erectus*) was observed in 1976 (Woodbury et al) but was not observed in 1996 (Gibney 1996).

Nineteen out of the 228 plant species identified on Buck Island are exotic, not native to the Virgin Islands (Woodbury and Little, 1976) (Ray, 2002, unpublished). These ten species have exhibited invasive characteristics throughout their ranges in the southeastern U.S. and the Caribbean, and their potential to disrupt the natural processes of the tropical dry forest. Six of these species found on Buck Island are invasive exotic species and are of immediate concern including *Urochloa maxima* (Guinea grass), *Leucaena leucocephala* (tan-tan, wild tamarind), *Tecoma stans* (cedar Thomas), *Bromelia penguin* (wild pineapple, penguin), *Boerhavia erecta* (boerhavia), and *Aloe vera* (aloe). Three additional species of exotics present and known to exhibit invasive characteristics in the region are *Melicoccus bijugatus* (genip), *Thespesia populnea* (haiti-haiti, seaside maho), and *Morinda citrifolia* (painkiller, noni). One exotic plant species with historical consideration had been expanding its population on Buck Island, is *Tamarindus indica* (Tamarind tree). Certain individual tamarind trees will be preserve in place (no treatment or removal) including several large historic individuals on the north and west side of Buck Island. However, seedlings, mostly located in a drainage guts on the north shore of the island, have been treated and are now at acceptable maintenance levels. To further the island-wide flora restoration program the National Park Service implemented a non-native invasive plant control program in 2004. Control phases I-IVA targeting ten of the non-native invasive plants has been completed. To date 85 percent of the island target non-native invasives have been controlled. The park conducts maintenance spraying for ten target species annually. The invasive exotic vegetation on Buck Island is discussed in detail in the *Exotic Plant Management Plan Environmental Impact Statement for the South Florida and Caribbean National Parks* (NPS 2006c).

3.2.2 Threatened, Endangered and Candidate Species

Buck Island Reef NM provide critical nesting habitat for four species of sea turtle including threatened green turtle (*Chelonia mydas*), threatened loggerhead (*Caretta caretta*), endangered leatherback turtle (*Dermochelys coriacea*), and hawksbill turtle (*Eretmochelys imbricata*). US Fish and Wildlife Service has identified Buck Island Reef as an index beach for hawksbill sea turtle recovery where on-going research is providing critical information toward species recovery goals in the Caribbean. Current seasonal nesting estimates indicate between 40-80 nesting hawksbill females per year; 10-20 green turtles; 2-4 loggerheads; and 1-4 leatherback sea turtles. Hawksbill sea turtles primarily nest along and within the coastal beach forest habitat on the north and south shorelines to maximum depth of 13 feet from high water line.

In the park the endangered brown pelican (*Pelicanus occidentialis*) nests and forages, and the least tern (*Sterna antillarium)* locally protected nests seasonally on the southwestern sand spit. The brown pelican rookery, located on the island's north side includes most of the vegetated slopes and nesting numbers remain stable. Observations on pelican nesting were conducted with USFWS, average number of adults observed over 10 site visits was 54; with chicks ranging from fledged to downy. Only 18 nests with attending adults were observed at any one time. Least tern nesting success throughout the territory has been declining and USFWS has been conducted extensive monitoring to determine the cause. Although least terns have nested successfully on Buck Island Reef nesting has been sporadic for last several years.

Recently two marine invertebrates elkhorn (*Acropora palmata*) and staghorn (*Acropora cervicornis*) coral were listed as threatened under the Endangered Species Act. There is a substantial population of elkhorn coral within the park's shallow hard bottom coral areas and staghorn coral is found in small patches scattered along the coral barrier reef and lagoon shoreline.

3.2.3 Other Wildlife Species

Birds at Buck Island Reef National Monument includes species which frequent the salt pond behind Diedrichs Point such as herons (*Ardea* sp.), egrets (*Egretta* sp.), and ducks, including Bahama white-cheeked pintail ducks (*Anas bahamiensis*). Other birds which frequent the beaches and shoreline coastal areas include sandpipers *(Calidris, Tringa,* and *Actitis* spp.), rarely/gulls (*Larus* sp.), plovers (*Charadrius* sp.), yellowlegs (*Tringa* sp.), terns (*Sterna* sp.), and stilts (*Himantopus mexicanus*). Birds known to be permanent residents or breeders on the island include bananaquit (*Coereba flaveola*), the Antillean crested hummingbird (*Orthorhyncus cristatus*), the green throated carib (*Eulampis holosericeus*), seasonal warblers (*Dendroic*a sp.), the black-throated grass quit (*Tiaris bicolor*), mangrove cuckoo (*Coccyzus minor*), white crowned pigeon (*Patagioenas leucocephala*), common ground dove (*Columbia passerina*),

pearly–eyed thrasher (*Maragarops fuscatus*), and belted kingfisher (*Cerle alcyon*). There is a roosting area for the magnificent frigate bird (*Fregata magnificens*), although there is no record of them nesting on the island. Several raptors have been observed on the island, including the red-tailed hawk (*Buteo jamaicensis*)/hardly ever seen since anymore since eradication of tree rat, peregrine falcon (*Falco peregrinus*), and ospreys (*Pandion haliaetus*).

NPS Herpetofauna Survey found two of three lizards on Buck Island are endemic to St. Croix (*Sphaerodactylus beattyi* and *Anolis acutus*) and the surrounding cays. The only introduced species detected on Buck Island, the tropical house gecko (*Hemidactylus mabouia*), is ubiquitous throughout the West Indies (Waddle, 2002). Throughout the day lizards can be seen in the beach forest vegetation. The more cryptic geckos can be found hiding under leaf litter or fallen dead wood. Hermit crabs *(Coenobita clypeatus*) are found all along the shoreline. Ghost crabs (Ocypode quadrata) remain in their wet sand burrows at or above the high tide line. At least two genus of land crab (*Cardisoma and Ucides*) can be found in the low beach forest and higher elevations.

The non-native roof or tree rat (*Rattus rattus*) and Indian mongoose (*Herpestes auropunctatus)* were at one time the only mammals known to occur on the island. These destructive pests were introduced by man and were severely altering the flora and fauna on the island, including predating almost 100 percent of threatened green and endangered hawksbill sea turtles nests and the disrupting threatened least tern nesting colony success. Between1980 -1999 the NPS conducted an island-wide eradication for these two pervasive exotic predators. In 2001 the island-wide rat eradication project was completed. The project was successful but will require regular monitoring to ensure continued control. To ensure no accidental reintroduction goes undetected, NPS conducts bi-annual rat snap trap monitoring along 5 trap lines to ensure the island remains rat-free as well as conducting regular beach patrols that check for any sign of mongoose. After the rat population declined, the European house mouse (*Mus musculus*) was observed. Evidently the rat infestation was limiting the mouse population, which was not detected until the top predator had been removed from the island (Witmer, 2007). The success of the removal of mongoose and tree rat has been evident in elimination of predation on sea turtle nests, the re-growth and spread of native flora due to successful germination of seeds formerly eaten by rats, and a visible increase in bird nesting and small lizard populations on Buck Island.

3.3 LAND USE

In addition to the islands natural wealth, Buck Island has been the scene of much cultural activity, playing an integral role in the prehistory and history of St. Croix. The island has been used by both prehistoric and historic peoples who sought to exploit it rich variety of marine fauna and terrestrial flora. Little is known about the activities of the prehistoric peoples other than seasonal use as a fish camp to harvest vast quantities of conch (*Strombus gigas)* and fish in near shore reef environment. In the 1700s-1900s slaves were sent to the island to harvest

lignumvitae trees and to gather fish and shellfish, and harvest goats. A Danish Royal Signal Station was maintained at the top of the island and several ships have wrecked on the reef over the centuries allowing for introduction of a variety of non-native flora and fauna (M. Hardy, SEAC 1780).

The island was ceded to the United States by Denmark in 1917 and placed under the control of the Government of the Virgin Islands for public purposes. In 1962 the island was transferred to the National Park Service (Presidential Proclamation No. 3443) establishing Buck Island Reef National Monument for the purpose of "protecting Buck Island and its adjoining shoals, rocks, and undersea coral reef formations" and to preserve "one of the finest marine gardens in the Caribbean Sea" for the benefit and enjoyment of the people and to protect it from "despoliation and commercial exploitation. The park originally consisted of approximately 176 acres of land and 704 acres of water. In 1975, thirty acres of submerged lands were added by Presidential Proclamation (No. 4346). In 2001, under the U.S. Coral Reef Initiative, the monument was expanded (Presidential Proclamation No. 7392) to include submerged lands totaling 19,015 acres, to bring into the monument "additional objects of scientific and historic interest, and provide necessary further protection for the resources of the existing monument and prohibit all extractive uses." Interim Regulations (36 Code of Federal Regulations Part 7) were published in the Federal Register (effective May, 2003) prohibiting extractive uses (fishing, taking whelk, conch, lobster, etc.) and anchoring except in areas of deep sand, in the event of emergencies (all other anchoring subject to permit), or for administrative purposes. The interim rules remain in effect until final regulations are adopted upon completion of a general management plan to guide the park for the next 20 years. The interim regulations supersede the limited authorization for extractive uses included in proclamation (No. 3443) of December 28, 1961. The park is now one of only a few fully protected marine areas in the National Park System.

3.4 CULTURAL/PALEONTOLOGICAL RESOURCES

The original inhabitants of these Virgin Islands, Taino, Arawak, and Carib Indians, probably visited Buck Island but left no lasting sign of their presence. There are conch middens indicating the island may have been used as a pre-historic fish camp. The Spanish, English, Dutch, French, and Knights of Malta all attempted to establish themselves permanently on St. Croix. Denmark held St. Croix the longest from 1733 until 1917. During that time Buck Island was owned by Mr. Dietrich's, the Clerk of the Danish Court, who had a small farm on the northern side of the island and a small cottage above the beach at West Beach. The Danes also maintained a light tower at the top of the island to warn ships away from the reef. In 1917, the Danish Islands were purchased by the United States and Buck Island was part of the public, government, or crown lands ceded to the United States. During the 1920's the island was leased for goat grazing and the surrounding waters frequented by fishermen. Under the Act of Congress of June 22, 1936, the island was placed under control of the Government of the Virgin Islands with legal title remaining in the United States. The local government recognized recreation value and by ordinance in 1948, established

the island as Buck Island Park. Appreciation of the island spread and by presidential proclamation on December 28, 1961, Buck Island Reef National Monument was established encompassing the island and its surrounding coral reefs.

Section 106 of the National Historic Preservation Act of 1966 requires the evaluation of the effects of any action on cultural resources (historic, architectural, and archeological) that are listed or eligible for listing in the National Register of Historic Places (NRHP). The activities associated with the translocation of *Ameiva polops* will cause only very minor, localized soil disturbances, and will not impact any prehistoric or historic sites.

3.5 LOCAL SOCIO-ECONOMIC CONDITIONS

Buck Island Reef NM is the largest area of its kind on St. Croix and fills an important recreational role for the community and island visitor. It is the number one tourist destination for the island of St. Croix; on average between 40,000 to 60,000 visitors come to the park each year either on private or park concession vessels. As a public use area Buck Island Reef is exposed to large and growing number of visitors who come to the island for an underwater snorkeling experience, sailing and boating, as well as hiking and picnicking. The bulk of the park's visitor activity occurs in the two picnic areas adjacent to the beaches on the south side of the island. There are two ways to get to the park, either on a private vessel or with park concession operations who charge a fee. Park concession operations bring visitors to the island on either half- or full-day charters which include the boat trip to and from the island, snorkeling at the underwater trail and one to two hour visit on the island. Visitor activities include hiking the one overland foot path or trail, swimming off the beach, sunbathing, snorkeling any of the numerous shoreline reefs, or picnicking at one of the two picnic areas on the south side of the island. Barbeque grilling is a favorite past-time for the local visitor. Frequently visitors plan entire family gatherings at the park and spend the entire day at the beach cooking lunch and dinner.

SECTION IV – METHODOLOGY & DEFINITIONS

In addition to determining the environmental consequences of the proposed action and other alternatives, the NPS *Management Policies 2006* and DO-12 require analysis of potential effects to determine if actions would impair a park's resources.

The purpose for which the Buck Island Reef National Monument is managed is articulated in the 1916 Organic Act establishing the National Park Service. The Organic Act tells us that the purpose is:

> *"to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of*

the same in such manner and by such means as would leave them unimpaired for the enjoyment of future generations."

The National Park Service may not allow the impairment of park resources and values unless directly and specifically provided for by legislation or by the proclamation establishing the park. Impairment that is prohibited by the *Interim Technical Guidance on Assessing Impacts and Impairment to Natural Resources (July 2003)*, National Park Service Organic Act, the General Authorities Act, and National Park Service Management Policies (NPS, 2006) is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values had the impact not occurred.

Impairment may result from NPS activities in managing the park, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park. In this section, a determination on impact on park resources is made in the conclusion statement of each resource area for each alternative. The NPS does not analyze the potential for impairment of recreational values/visitor experience (unless impacts are resource based), socioeconomic values, or park operations, however since this is a joint EA with USFWS socioeconomic values are addressed to meet their requirements.

4.0 METHODOLOGY

In this document, the NPS based its analysis of impacts and conclusions on discussions with the scientific community, a review of scientific literature and Park studies, and on professional judgments of technical experts and other federal and territorial agency staff. Using these data, the Ameiva Working Group determined which impacts would occur and assessed them according to their duration, extent, intensity, and whether or not the impact would cause impairment to BUIS resources. These parameters are defined below.

4.1 THRESHOLDS OF CHANGE

Threshold events are marked by a distinct change in conditions or level, and that a practical means of monitoring proximity to thresholds is available. The thresholds of change of a biological or ecological impact are designated as *intensity* and *duration*.

4.2 INTENSITY

For the purpose of this analysis, intensity or severity of the impact to the resource or discipline is defined as:

- *Negligible* is barely perceptible, not measurable, and confined to a small area.
- *Minor* is perceptible, measurable, and localized.
- *Moderate* is clearly detectable and could have appreciable effect.
- *Major* is substantial and highly noticeable.

4.3 DURATION

For the purpose of this analysis, duration of the impacts to the resource or discipline is defined as:

- *Short-term* are those that occur during implementation of the alternative.
- *Long-term* are those that extend beyond implementation of the alternative and would likely have permanent effects.

4.4 DIRECT VERSES INDIRECT IMPACTS

Direct effects are impacts caused by the alternative(s) at the same time and in the same location as the action. Indirect effects are impacts caused by the alternative(s) that occur later in time or farther in distance than the action, but still reasonably foreseeable. An indirect impact could occur because of a change to another resource or impact topic.

The following table reflects the combined action to collect *A. polops* from Green Cay NWR and re-introduction to Buck Island Reef NM. No adverse impacts were found across all impact topics, short term or long term, from the proposed alternatives to Green Cay NWR.

Following table addresses alternatives level of affect of *A. polops* re-introduction to Buck Island Reef NM.

	Habitat / Vegetative	T&E and Species of Concern	Other Wildlife	Land Use	Cultural Res/Paleo Resources	Socio-Eco Conditions
ALT A	Neg/Lt	Neg/Lt	Neg/Lt	Neg/Lt	Neg/Lt	Mod/Lt*
ALT B	Neg/Lt	Min/St*	Min/St*	Neg/Lt	Neg/Lt	Mod/Lt*
ALT C	Neg/Lt	Neg/Lt	Neg/Lt	Neg/Lt	Neg/Lt	Neg/Lt
ALT D	Neg/Lt	Neg/Lt	Neg/Lt	Neg/Lt	Neg/Lt	Neg/Lt

Table1. Alternatives impact on resources in affected environment ("*" See Notes below)

Notes:
Alt A/Socio – No A. polops will be re-introduced to BUIS; no visitor benefit.
Alt B/T&E – Temporary enclosures reduce sea turtle nesting habitat in beach forest by 10 percent for less than 2 months pre-peak season. Other Wildlife – There is a potential need to trap pearly-eye thrashers (loss of 1-2 birds during enclosure phase) to protect *A. polops* while in enclosures to reduce potential

predation on lizards. Socio – Re-introduction of *A. polops* provides opportunity for visitors to view lizard in natural habitat.

4.5 CUMULATIVE IMPACTS

As defined by CEQ Regulations (40 CFR, Part 1508.7), "cumulative impacts" are those impacts on the environment resulting from the incremental impacts of the proposed, past, present, and foreseeable future actions regardless of who or what agency undertakes the actions. Cumulative impacts can result from minor but collectively significant actions taking place over time both within NPS boundaries and outside those boundaries.

Cumulative impacts were assessed by combining the potential environmental impacts of the alternatives with the potential impacts of known projects that have occurred in the past, are currently occurring, or are projected to occur in the future. Cumulative impacts are addressed for each alternative in a conclusion section.

SECTION V – ENVIRONMENTAL CONSEQUENCES EACH ALTERNATIVE

5.1 ALTERNATIVE A – NO ACTION

Under this alternative, the National Park Service and U. S. Fish and Wildlife Service, would stop actively pursuing the translocation and re-introduction of the St. Croix Ground Lizard (*Ameiva polops*) to Buck Island Reef National Monument. This alternative is unlikely to achieve the recovery objectives outlined in the Recovery Plan of the species, that is “establish a self-sustaining population (500 or more individuals) on Buck Island, and obtain adequate population dispersion so the species can be considered for reclassification form endangered to threatened” (USFWS 1984).

5.1.1 Habitat Impacts

If this alternative were selected, USFWS were continue to manage Green Cay NWR for existing A. polops populations, and GVI-DPNR continue management of Protestant and Ruth Cay, and there would be no new herptofauna species utilizing the Buck Island terrestrial habitat.

5.1.2 Biological Impacts

No *A. polops* would be captured and collected for translocation and re-introduction to Buck Island Reef NM. No new spatially segregated and self-sustaining population of St. Croix Ground lizards would be created and eventual catastrophic loss of the species could occur, species future would remain precarious due to spatial and habitat limitations, and threats to the existing populations on the three offshore cays from exotic predators and habitat

disturbance. No further population growth can be expected and radical population fluctuations could be expected due to poor rainfall, reduction in prey base, storm surge, etc…which will impact population growth and survival.

5.1.3 Threatened, Endangered and Candidate Species

No impact to existing endangered A. polops population on Green Cay NWR or any other federally protected species on Green Cay NWR or Buck Island Reef NM. NPS and USFWS are conducting joint EA and have conducted extensive ESA Section 7 consultation concerning project proposed alternatives to ensure compliance with Endangered Species Act. Choosing this alternative would result in a negative impact to the St. Croix Ground Lizard because the potential catastrophic loss of the species would not be mitigated by the creation of a fourth spatially separated population.

5.1.4 Predator Control Impacts

No *A. polops* would be captured or collected from Green Cay NWR; USFWS would have to continue predator control to ensure that existing *A. polops* populations would not be further negatively impacted by mongoose or tree rats. Predator control and monitoring will continue on Buck Island Reef regardless of *A. polops* translocation and re-introduction or not.

5.1.5 Socio-Economic Impacts

No *A. polops* would be captured and collected from Green Cay NWR. If this alternative was chosen, Buck Island Reef NM visiting public would loose the opportunity for education related to restoration of a globally endangered species and related to on-going resource management programs to provide safe and successful habitat for the St. Croix Ground Lizard. If *A. polops* is not successfully translocated and a viable population established, park visitors would loose the opportunity for further environmental education and interpretation, and potential wildlife observations and photography. There are no impacts to socio-economic or cultural resources through this no action alternative.

5.1.6 Conclusion – Alt A: Cumulative Impacts / Summation of Cumulative effects for various resources and impairment finding for this alternative

Under Alternative A, there will be no impact to Green Cay NWR as no *A. polops* will be captured or collected for translocation. A. polops population will continue to be impacted and potentially impaired due to reduced reproductive success from resource limitations and reduced habitat quality. There will be no long term impacts to Buck Island Reef NM as no *A. polops* will be re-introduced; Buck Island ecosystem will continue to exist with reduced number of herptofauna species due to no re-introduction of native St. Croix Ground Lizard.

5.2 ALTERNATIVE B – Capture, collect, translocate, and re-introduce *A. polops* to Buck Island Reef NM (PREFERRED ALTERNATIVE)

Under this alternative, the NPS and USFWS would reduce the risk of species extinction and foster the recovery of the species. The translocation population and habitat would be managed to increase the likelihood of a successful reintroduction of *Ameiva polops.* This alternative requires continued implementation of existing NPS Resource Management programs including non-native predator monitoring and control (Witmer, 2002), non-native invasive plant management program (NPS Exotic Plant Program 2006), and adds a new endangered species to the island's native fauna requiring establishing a new monitoring program to ensure documentation of species successful translocation and establishment on Buck Island (NPS Ameiva Implementation Plan, 2007; Tregelia, 2008). Buck Island's native flora and fauna continue to demonstrate dramatic recovery since the removal of the non-native predators. Buck Island provides federally protected land that will reduce the likelihood of *A. polops* extinction. Buck Island is a larger land area than the three low-lying cays that currently support *A. polops*; the relief and size of Buck Island will reduce the potential hurricane and storm surge impact to the translocated population and provide habitat protected from non-native predators and development where *A. polops* populations can recover undisturbed in the Virgin Islands.

5.2.1 Habitat Impacts

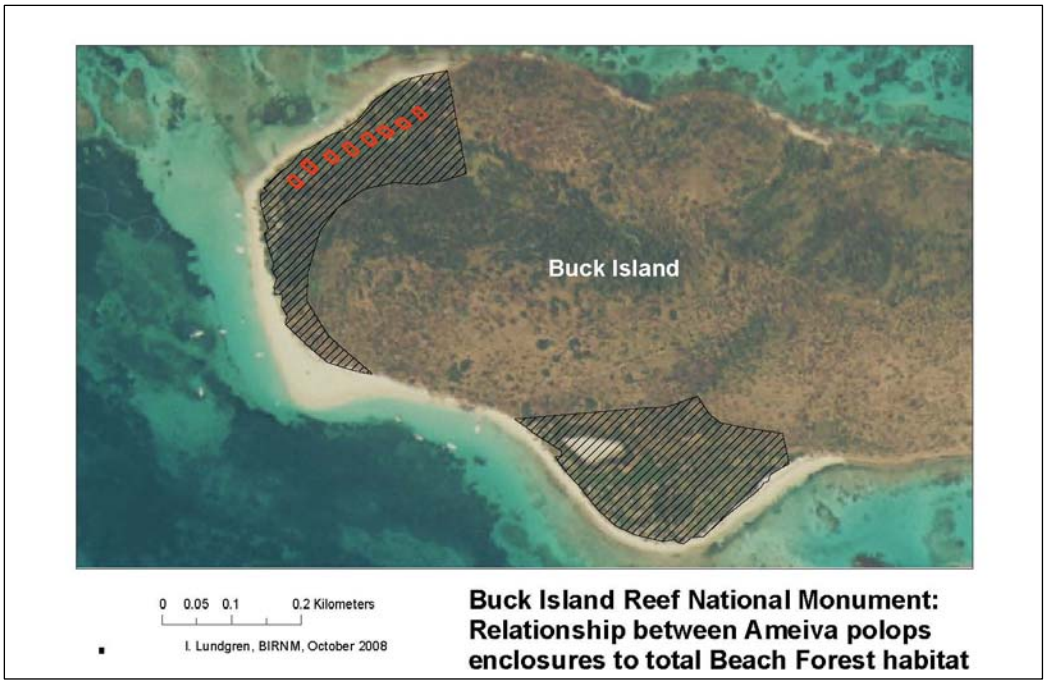

Figure 3. Location of temporary *A. polops* enclosures on Buck Island Reef.

Translocation of lizards into Buck Island terrestrial ecosystem is anticipated to have no long term impacts on terrestrial habitat. Installation of eight temporary

enclosures (10m wide x 20m long x 30cm high) to hold translocation population is required to insure survivorship and enable monitoring of translocated individuals prior to release to Buck Island. There will be no long term impact to existing herptofauna, sea turtles and various small lizards, and various crabs, as the enclosures cover less than 1.7 percent of available beach forest on Buck Island and will only be in place for less than six months.

These areas will only be temporarily closed to other ground dwelling animal movement (late-April to mid-June, 2008), and will be monitored daily post-translocation to ensure no harm to other wildlife (birds, lizards, crabs) during project use. Enclosures are not in primary sea turtle nesting habitat and are located more than 20 meters above high water in beach forest. In the event a nesting sea turtle encounters the enclosures the sea turtle will be able to move around enclosures to other suitable nesting areas. During post-translocation monitoring, April to June, staff will be walking through and around enclosures; foot traffic will have no long term impact on beach forest floor which is covered with heavy leaf litter and dead trees.

5.2.2 Biological Impacts

This alternative does not represent a threat and should not have an adverse impact on resident herptofauna or on any other biological resource (Waddle, 2002). The St. Croix Ground Lizard, *Ameiva polops*, is an endemic species and it is believed was a part of the Buck Island community prior to the introduction of the exotic mongoose in 1912 (Philibosian and Riubal, 1971).

5.2.3 Threatened, Endangered and Candidate Species

Choosing this alternative will restore an endemic species that has gone extinct from the main island of St. Croix, U. S. Virgin Islands and now only remains on three small offshore cays, with limited habitat and continued threat from exotic predators and habitat degradation. Introduction of *Ameiva polops* will have no impact to threatened and endangered sea turtles nesting either on the islands open beaches or in the littoral or beach forest nor to the protected seasonal migratory least tern (*Sterna antillarium)* nesting on the open sand spit on the south side of the island. NPS and USFWS have conducted extensive ESA Section 7 consultation and are undertaking this EA jointly to collect and re-introduce A. polops to Buck Island Reef NM. No impact to other federally protected species is anticipated through this action.

5.2.4 Predator Control Impact

To ensure successful translocation and re-introduction that will result in a successful translocated population of *A. polops* NPS will continue predator monitoring and control for mongoose and tree rat on Buck Island. Monitoring of *A. polops* success will include observations of any potential impact from last non-

native mammal, house mouse (*Mus musculus*) on the island to ensure no adverse impact on translocated *A. polops* population. Both May and December 2007 snap trap census found mouse present in the north shore beach forest translocation area however in May, spring census, no mice were captured. To prevent any potential impact on lizards in enclosures from opportunistic predation by pearly-eye thrashers, temporary control of pearly-eyed thrasher (*Maragarops fuscatus*) may be conducted only during the enclosure phase of translocation.

5.2.5 Socio-Economic Impacts

No adverse impact to current visitor use activities is anticipated; re-introduction will provide for beneficial impact from potential sightings of lizard which will enrich visitor experience at Buck Island. Some of the translocation enclosures are visible from hiking trail but will be clearly marked and visitors educated to not disturb the enclosures. Enclosure presence will not adversely impact the visitor's access to the trail or effect the hiking trail experience. Park visitors have been provided with public education about the translocation and have expressed interest and excitement for the project. Translocation area will be posted for the public to prevent any accidental damage to enclosures. NPS law enforcement staff will be conducting regular patrols at Buck Island and maintain daytime contact with visitors and concession operators to ensure visitors are not interfering with enclosures. No maintenance will be necessary along the north shore hiking trail during the translocation/holding period. Public opportunities such as environmental education and interpretation, and wildlife observation and photography could be offered, under NPS and USFWS supervision during translocation / holding period.

5.2.6 Conclusion – Alt B: Cumulative Impacts / Summation of Cumulative effects for various resources and impairment finding for this alternative

Under Alternative B, there will be minor, short term impacts to Green Cay NWR during capture and collection of 64 *A. polops* for translocation to Buck Island Reef NM. Consideration has been taken regarding effects of removal of individuals from the Green Cay parent population. The most recent surveys estimate the Green Cay population at 576 individuals, likely an underestimate because of low detectability. Another survey technique resulted in estimates of 1169 and 2177 individuals (Mackay 2007). Only 64 adult *Ameiva polops* will be captured for the translocation which is 10 percent of the Green Cay population using the lowest population estimate of approximately 600+ individuals. It is unlikely that the removal of 60 individuals will adversely affect a population the size of the Green Cay parent population. Preferably 40 females and 24 males, and a mix of size classes, will be the target for the translocation population allowing for 8 animals per enclosure plot. This will facilitate effective monitoring and not crowd the enclosures.

Researcher capture activities will have short term minor impacts to island vegetation during capture effort. Efforts will be made to capture individuals from a range of locations on Green Cay reducing the impact to any one location on Green Cay. The Services anticipate that the proposed alternative is not likely to adversely affect the species because of beneficial effects.

No other impacts to wildlife should occur during capture activities; threatened brown pelican is not currently nesting. Other wildlife, crabs and lizards, will not be impacted through captured targeted at *A. polops*. There are no impact to socio-economic (visitors are not allowed on GCNWR without permit) or cultural resources (limited archeological sites; all subsurface) anticipated through capture and collection process.

There will be a long term beneficial impact to Buck Island Reef NM with the re-introduction of *A. polops.* Buck Island Reef terrestrial ecosystem will have a historic species of Teiid lizard re-introduced to the island. No impact to existing herptofauna is anticipated. Beach forest habitat has ample space and prey density to support translocation population and to support anticipated population growth of successful *A. polop* population. No other wildlife will be impacted by re-introduction of *A. polops* except potential temporary reduced use of north shore beach forest habitat to early nesting sea turtles during enclosure use and limited reduction of pearly-eye thrasher (potential opportunistic predators) during enclosure period. There will be limited short term visual impact to BUIS visitors using beach forest hiking trail that will be mitigated by education and signage identifying *Ameiva* enclosure areas.

5.3 Alternative C – Translocate and re-introduce to main island of St. Croix, Virgin Islands

Under this alternative, *A. polops* from Green Cay NWR would be collected and translocated to an area with suitable habitat on the main island of St. Croix, VI. No area on St. Croix currently meets the criteria for safe translocation of A. polops back to the main island without extensive site preparation, conservation measures, and continual management of non-native predators.

5.3.1 Habitat Impacts

If this alternative were selected a fully protected coastal habitat would have to be identified and assessed to determine if the area can provide suitable habitat for A. polops. No area on St. Croix currently under federal or territorial administration meets the criteria established in the USFWS Recovery Plan1984.

5.3.2 Biological Impacts

None - If this alternative were selected and *A. polops* could be translocated to area on St. Croix no impact to existing herptofauna community is anticipated, especially since there is little chance that translocated individuals would survive.

5.3.3 Listed Species and Trust Resources

Choosing this alternative would result in a adverse impact to the St. Croix Ground Lizard because all translocation individuals would become prey for exotic predators, especially mongoose. This alternative would not provide a suitable location where *A. polops* could successfully reproduce and ultimately establish another viable population to avoid catastrophic loss through predation, hurricane, flood, or tsunami. This option would not affect any other species.

5.3.4 Predator Control Impacts

There is no area on St. Croix where exotic mongoose or tree rats are currently controlled or could be controlled through extensive management actions. There would be no impact to existing predator populations.

5.3.5 Socio-Economic Impacts

If this alternative was chosen, an area of “suitable” habitat would have to be put under federal or territorial conservation management, possibly removing a large area of land from the public or private sector, the area would have to be managed for *A. polops* success, predators controlled on a regular basis, and potential land development in area and adjacent to area subject to conservation restrictions. There would be a loss of access to land to the public, but once the area was established some opportunity for public use for environmental education and interpretation pertaining to *A. polops*.

5.3.6 Conclusion – Alt C: Cumulative Impacts / Summation of Cumulative effects for various resources and impairment finding for this alternative

Under Alternative C, there will be minor, short term impacts to Green Cay NWR during capture and collection of 64 *A. polops* for translocation to selected location on St. Croix, Virgin Islands. Consideration has been taken regarding effects of removal of individuals from the Green Cay parent population. Researcher capture activities will have short term minor impacts to island vegetation during capture effort. Efforts will be made to capture individuals from a range of locations on Green Cay reducing the impact to any one location on Green Cay. Alternative C may adversely affect the species because A. polops captured on Green Cay and re-introduced to St. Croix mainland have little likelihood of survival due to presence of non-native predators, mongoose, and limited suitable habitat; No other impacts to wildlife should occur during capture activities;

threatened brown pelican is not currently nesting. Other wildlife, crabs and lizards, will not be impacted through captured targeted at *A. polops*. There are no impact to socio-economic (visitors are not allowed on GCNWR without permit) or cultural resources (limited archeological sites; all subsurface) anticipated through capture and collection process. No area on St. Croix currently meets the criteria for safe translocation of A. polops back to the main island without extensive site preparation, conservation measures, and continual management of non-native predators. USFWS has determined that Alternative C will not benefit the species recovery.

There will be no long term impacts to Buck Island Reef NM as no *A. polops* will be re-introduced; Buck Island ecosystem will continue to exist with reduced number of herptofauna species due to no re-introduction of native St. Croix Ground Lizard.

5.4 Alternative D – Translocation to other United States owned Caribbean island location

Under this alternative, individuals of *A. polops* from Green Cay NWR would be collected and translocated to another offshore island with suitable habitat located in the Virgin Islands or Puerto Rico.

5.4.1 Habitat Impacts

If this alternative were selected, there would be impact to habitat on Buck Island, St. Croix Virgin Islands.

5.4.2 Biological Impacts

None - If this alternative was selected there would be not be any impact to biological community at Buck Island. However, area selected to translocation *A. polops* to would have to be fully assessed and extensive management actions undertaken to prepare area for successful introduction of St. Croix Ground Lizard. Most other areas, specifically off shore cays in Virgin Islands, due not have the appropriate habitat requirements, many still have threats from development, non-native predators, and all would be logistically and cost prohibitive.

5.4.3 Threatened, Endangered and Candidate Species

Choosing this alternative would result in an adverse impact to the St. Croix Ground Lizard separating the lizard from its ancestral home, and may impact other unknown Teiid lizards through genetic mixing if A. polops is successfully moved to new island location. In addition the other islands potentially available are on the Puerto Rican Bank, and are therefore not within the historic range of Ameiva polops, and are presently occupied by *Ameiva exsul*. Introduction of *A.*

polops into *A. exsu*l range would risk reduction of available resources for each species, as well as present the possibilities of disease introduction and genetic hybridization (Cunningham, A., 1996; Stockwell, C. A. et al, 1996; Species Survival Commission, 1987).

5.4.4 Predator Control Impacts

There would be no change to non-native predator control actions on Buck Island Reef NM; bi-annual monitoring would continue. Extensive assessment and control actions would be necessary to ensure predator control on selected island.

5.4.5 Socio-Economic Impacts

If this alternative was chosen the opportunity to provide the St. Croix community with environmental education and interpretation about their St. Croix Ground Lizard, and potential wildlife observation would be eliminated.

5.4.6 Conclusion – Alt D: Cumulative Impacts / Summation of Cumulative effects for various resources and impairment finding for this alternative

Under Alternative D, there will be minor, short term impacts to Green Cay NWR during capture and collection of 64 *A. polops* for translocation to selected location on St. Croix, Virgin Islands. Consideration has been taken regarding effects of removal of individuals from the Green Cay parent population. Researcher capture activities will have short term minor impacts to island vegetation during capture effort. Efforts will be made to capture individuals from a range of locations on Green Cay reducing the impact to any one location on Green Cay. No other impacts to wildlife should occur during capture activities; threatened brown pelican is not currently nesting. Other wildlife, crabs and lizards, will not be impacted through captured targeted at *A. polops*. There are no impact to socio-economic (visitors are not allowed on GCNWR without permit) or cultural resources (limited archeological sites; all subsurface) anticipated through capture and collection process. Alternative D may adversely affect the species because *A. polops* captured on Green Cay and re-introduced to another Virgin Island or Puerto Rican island has would present a non-native Teiid lizard into the native environment; limited likelihood of successful introduction due to competition and possible predation from other Teiid species and presence of non-native predators, mongoose, and habitat differences; No island in northern Virgin Islands or Puerto Rico currently meets the criteria for safe translocation of *A. polops* without extensive site preparation, conservation measures, and continual management of non-native predators. USFWS has determined that Alternative D will not benefit the species recovery.

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SECTION VII – LIST OF PREPARERS AND CONTRIBUTORS

The National Park Service, Buck Island Reef NM, Division of Resource Management and U. S. Fish and Wildlife Service, Sandy Point NWR/Green Cay NWR, prepared this Environmental Assessment, with assistance from the U. S. Fish and Wildlife, Ecological Services Caribbean Field Office, Government of the Virgin Islands Department of Planning and Natural Resources, Division of Fish & Wildlife, and Texas A&M University Department of Wildlife and Fisheries Sciences/Curator of Amphibians and Reptiles. The primary author was Zandy Hillis-Starr, Chief Resource Management, Christiansted NHS/Buck Island Reef NM/ Salt River Bay NHP&EP.

Zandy Hillis-Starr
NPS, Christiansted NHS/Buck Island Reef NM/ Salt River Bay NHP&EP
2100 Church Street, #100
Christiansted, VI 00820

Ian Lundgren, Biologist
Buck Island Reef NM
National Park Service
2100 Church Street, #100
Christiansted, VI 00820

Michael Evans
Claudia Lombard
USFWS, Sandy Point NWR/Green Cay NWR
US Federal Building, 3013 Golden Rock
St. Croix, VI 00820

Marelisa Rivera
USFWS, Ecological Services/Caribbean Field Office
PO Box 491 Boqueron, PR 00622

Dr. Renata Platenberg
GVI, DPNR, Division of Fish & Wildlife
6291 Estate Nazareth, St. Thomas, VI 00802

Jennifer Valiulus
GVI, DPNR, Division of Fish & Wildlife
45 Mars Hill, Frederiksted, VI 00840

Dr. Lee Fitzgerald
Michael Tregelia
Department of Wildlife and Fisheries Sciences
Texas A&M University
College Station, TX 77843

SECTION VIII - CONSULTATION AND COORDINATION

This proposed action to translocate the globally endangered St. Croix Ground Lizard to Buck Island Reef National Monument thereby re-introducing a native ground dwelling lizard to its native habitat is consistent with the **National Park Service Organic Act (16 U.S.C.)** "to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the same in such a manner and by such means as would leave them unimpared for the enjoyment of future generations."

(a) Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) (7 U.S.C. 136 *et seq*.) – No insecticides, fungicides, or rodenticides will be used during this proposed action.

(b) Endangered Species Act of 1973 (ESA) (7 U.S.C. 136, as amended) and VI Endangered and Indigenous Species Act of 1990 (Act No. 5665) – Buck Island Reef NM provides nesting habitat for four species of threatened or endangered sea turtle, and seasonal nesting for endangered brown pelican, and protected least tern on the southwestern open beach sand spit. Proposed action will not impact any of these protected species. 1984 FWS Recovery Plan identified Buck Island Reef NM as a release site for *A. polops* to establish another viable population location to avoid catastrophic loss of species. In order to comply with the ESA of 1973, the Park must protect endangered species and their habitats (PL 93-205). Formal consultation between NPS and FWS has been conducted during all phases of the proposed action development; NPS and FWS are undertaking this capture and translocation action jointly.

(c) Migratory Bird Treaty Act of 1918 (40 Stat 755) has no effect on the action.

(d) Animal Damage Control Act of 1931 gives authority to remove injurious animals for the protection of birds and other wildlife clearly providing for continued non-native pest control to support success of translocated population.

(e) Coastal Zone Management Act (16 U.S.C. 1 {1916} *et seq*.) "Preserve, protect, develop and where possible restore or enhance the resources of the nation's coastal zones" supports the translocation of an endangered species to a protected habitat to further the species survival. NPS has conducted formal consultation with the Government of the Virgin Islands' Department of Planning and Natural Resources Division of Fish & Wildlife in conformance with the Coastal Zone Management Act.

(f) General Management Plan – Buck Island Reef National Monument, 1983 – "recommends reintroduction of the St. Croix Ground Lizard dependent upon the successful eradication of mongoose on Buck Island". Mongoose and tree rate have been successfully eradicated from Buck Island as of 2001 (NPS Final Report, 2002).

(g) National Historic Preservation Act of 1966 (16 U.S.C. 470 *et seq,*), Archeological Resources Protection Act of 1979 (16 U.S.C. 470aa-11). With release of Draft EA, NPS would initiate formal consultation with the State Historic Preservation Office regarding effects on the Park's archeological and cultural resources.

(h) National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4332, as amended). Title I of NEPA require that Federal agencies plan and carry out their activities…"so as to protect and enhance the quality of the environment. Such activities shall include those directed to controlling pollution and enhancing the environment.**"**

(i) St. Croix Ground Lizard Recovery Plan, 1984 – "establish a self-sustaining population (500 or more individuals) on Buck Island by 1990, and obtain an adequate population dispersion so the species can be considered for reclassification from endangered to threatened." NPS did not meet the 1990 target date but Buck Island has been deemed ready to accept a translocation population of *A. polops* in 2007/2008.

SECTION IX LIST OF AGENCIES, INDIVIDUALS AND ORGANIZATIONS CONSULTED Personnel from the following agencies and organizations have been consulted or participated in the formulation of this Environmental Assessment;

U. S. Fish & Wildlife Service

Michael Evans, Refuge Manager
Green Cay NWR/ Sandy Point NWR
U S Fish & Wildlife Service
Federal Building, 3013 Estate Golden Rock
Christiansted, VI 00820

Claudia Lombard, Biologist
Green Cay NWR/ Sandy Point NWR
U S Fish & Wildlife Service
Federal Building, 3013 Estate Golden Rock
Christiansted, VI 00820

Marelisa Rivera
Ecological Services
US Fish & Wildlife Service- Boqueron Field Office
Carr 301 KM 5, Bo. Corozo
PO Box 491
Boqueron, PR 00622

Beverly Yoshioka
Ecological Services
US Fish & Wildlife Service- Boqueron Field Office
Carr 301 KM 5, Bo. Corozo
PO Box 491
Boqueron, PR 00622

Bryann J. Ybarra-Weckmann, Biologist
Ecological Services
US Fish & Wildlife Service- Boqueron Field Office
Carr 301 KM 5, Bo. Corozo
PO Box 491
Boqueron, PR 00622

Government of the Virgin Islands, Department of Planning & Natural Resources

Judy Pierce, Wildlife Biologist/Division Chief
Division of Fish and Wildlife
GVI, Department of Planning and Natural Resources
6291 Estate Nazareth, St. Thomas, VI 00802

Renata Platenberg, PhD
Reptile Ecologist/Wildlife Biologist
Division of Fish and Wildlife
GVI, Department of Planning and Natural Resources
6291 Estate Nazareth, St. Thomas, VI 00802

Jennifer Valiulus, Biologist
Division of Fish and Wildlife
GVI, Department of Planning and Natural Resources
45 Mars Hill, Frederiksted, VI 00840

William Coles
Endangered Species Coordinator
Division of Fish and Wildlife
GVI, Department of Planning and Natural Resources
45 Mars Hill, Frederiksted, VI 00840

Amy Mackay, Graduate Student
Maryland Cooperative Fish & Wildlife Research Unit
University of Maryland Eastern Shore
almackay@mail.umes.edu

Texas A&M University, Department of Wildlife & Fisheries Sciences

Lee Fitzgerald, PhD
Associate Professor and Curator of Amphibians & Reptiles
Department of Wildlife & Fisheries Sciences
Texas A&M University
College Station, TX 77843

Toby Hibbitts, PhD
Curator Division of Amphibians & Reptiles
Department of Wildlife & Fisheries Sciences
Texas A&M University
College Station, TX 77843

Daniel Leavitt, Graduate Student
Department of Wildlife & Fisheries Sciences
Texas A&M University
College Station, TX 77843

Michael Treglia, Master's Graduate Student
Department of Wildlife & Fisheries Sciences
Texas A&M University
College Station, TX 77843

Amanda Subalusky, Doctoral Student
Department of Wildlife & Fisheries Sciences
Texas A&M University
College Station, TX 77843

Consultation with local Veterinarian

Paul Hess, DVM
Island Animal Clinic
5 Corners Commercial Park
St. Croix, VI 00820

SECTION X LIST OF ALL FEDERAL, STATE, AND LOCAL LAWS AND PERMITS

Endangered Species Act of 1973

Capture and Translocation of Endangered Endemic St. Croix Ground Lizard, Ameiva polops, to Buck Island Reef NM, St. Croix, U. S. Virgin Islands, NPS Research and Collection Permit, BUIS-2007-SCI-0011, 11/01/2007.

Scientific/Endangered Species Collection Permit for Ameiva polops, St. Croix Ground Lizard, Permit No. STX-002-08, Issued by Government of the Virgin Islands, Department of Planning and Natural Resources, Division of Fish and Wildlife, November 1, 2007 to December 31, 2008.